INDOT

Consultant Services Bulletin

News Bulletin No. 98-2 October 1998

CONSULTANT NEWS BULLETIN 98-2
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APPENDICIES

Standard Drawing Index

If a contract has multiple Des. Nos. just one standard drawing index is to be prepared. If more than one consultant is preparing plans to be included in a contract, the Designer of the primary Des. No. is to prepare the standard drawing index to be included in the contract; the other designers will each prepare a list of standard drawings required for their part of the contract and submit it to the Designer of the primary Des. No. with a copy to the INDOT Design coordinator.

Design Memorandum 23 Supplemental Information

M.S.E. WALL SYSTEM

At field check plans submission, the designer will provide the Geotechnical Section a set of plans with the following information:

1. Top and bottom of wall elevations
2. Beginning and end station of the wall
3. Station of step locations in leveling pad

The Geotechnical Section will calculate the estimated applied soil bearing pressure. They will use this information for the geotechnical investigation. The final geotechnical report will provide the recommended allowable soil bearing pressure.

The designer shall calculate the applied soil bearing pressure and compare it to the allowable soil bearing pressure recommended in the geotechnical report. If the recommended allowable soil bearing pressure is less than the applied soil bearing pressure, the designer shall contact the geotechnical engineer for additional guidance.

The designer will prepare final plans showing neat-line drawings as described in Design Memorandum 23. The allowable soil bearing pressure shall be shown on the design plans.

After the contract has been let, the contractor will submit the design calculations and plans of the MSE wall. The designer will be responsible for the review of the design calculations and shop plans submitted by the contractor. For a federal - aid local agency project, such documents are subject to approval by the local agency or its design consultant.

Foundation Design

It is acceptable to use either the working stress or load factor method to design foundations, including piles.

Checklist of Recent Policy Changes Which are Occasionally Being Overlooked on Plans

I. TITLE SHEET
1.) ESALs – Show for Mainline, Shoulders, and Temporary Runarounds.
2.) Design Criteria (Follow Memo #26)
3.) Standard Specifications – 1995
4.) Standard Drawings – If metric they go in the contract book, not on the plans.

II. TYPICAL SECTION
1.) 75 kg/m² HMA Surface
165 kg/m² HMA Intermediate
2.) When QC/QA HMA mixes are specified show:
QC/QA PG Binder XX-YY, Mainline
QC/QA PG Binder XX-YY, Shoulder.

III. SOIL BORINGS SHEET
Pile Loading Table – See Design Memo No. 98-01 dated June 22, 1998.

IV. LAYOUT
Show flowable mortar as the backfill behind bridge end bents.

V. GENERAL PLAN
1.) Minimum bridge clear roadway width is now 9.4m for INDOT Projects.
2.) The pile loading shown on the General Plan shall be the ultimate load. The pile loading is not required on the detail drawings, but if shown it must be the ultimate load.

VI. PIPE MATERIAL SHEET
Make sure this sheet is included at final check prints stage. It usually will be the last sheet in the plans.

Grade 70 Weathering Steel

AASHTO allows the use of Grade 70 weathering steel. Approval to use Grade 70 weathering steel will be made on a case by case basis by the Chief-Design Division for INDOT projects. Generally, the economic analysis prepared at the structure size and type stage will serve as the basis for such decision.

On LPA projects the designer must obtain the written approval of an elected official of the LPA.

14-1.02(03) Construction Changes

Any changes made after a project is let and awarded must be processed as a construction change. Construction changes are processed as follows:

1. Changes are made to the tracings with a revision note placed in the revision block on the title sheet or index sheet. This revision note must contain the date of the revision, the revised sheet numbers and a short explanation of the changes. A note should also be placed on the revised sheet or sheets in a location that will not restrict its visibility. NO ERASURES can be made to the original tracings since they are considered a legal document at the time of letting.

   If space allows, hash mark through the original item to be revised and make the revision on the same sheet. The revision should be placed on the sheet in a location that will not restrict visibility. If the revision is too large to be shown on the original sheet, note the deleted sheet number in the revision block (this deleted sheet should remain in the original set of plans). Prepare a new sheet to be added to the original set of plans with the sheet number the same as the deleted sheet followed by an alpha character (example: Delete Sheet 7, Add Sheet 7A).

2.a. If the designer is a consultant, the designer submits the revised tracings to the assigned reviewer in the Design Division, with a copy of the transmittal memo to the appropriate Design Section Manager. After the reviewer has checked the plans the reviewer submits the revised tracings to the Records Unit.

2.b. If the designer is a Design Division employee submit the revised tracings to the Records Unit.

3. A memorandum will be prepared by the Records Unit, Division of Design, to the District Construction Engineer (see Figure 85-3E). Six sets of full-size plans should accompany this memorandum to the District. Any quantity revisions are computed and transmitted by the designer with the memorandum for use by the project engineer in preparing Form IC-626.

4. The Records Unit will send a half-size set of plans and a copy of this memorandum to:

   a. the Federal Highway Administration (if applicable);
   b. the contractor;
   c. the project engineer;
   d. Operations Support
   e. Division of Land Acquisition (if R/W revised);
   f. The project manager, Division of Design;
   g. The consultant (if applicable);
   h. Bridge Inventory Unit, Roadway Management Division (if a bridge project);
   i. Records Supervisor, Division of Design.

Shoulder Corrugations

Shoulder corrugations are to be provided on all rural NHS routes if the width of the shoulder is greater than 1 m. See 52-1.02(04) – revised March 1998.

Practice Pointers

1. Don't show K values for vertical curves on the plans.

2. If a WGB transition is required on at least one corner of a bridge, it should be used on all 4 corners. See 49-5.04 (02) lb.

3. When the design year AADT is equal to, or greater than 6,000 and the design speed is greater than 80 km/h, Guardrail End Treatment Type OS is to be used. See 49-5.04, item 1.

4. Generally, do not leave a space between twin box culverts.

5. If the AADT is greater than 4,500 or if the percent trucks (AADT) is greater than 10% ask for a pavement design for the temporary runaround. See 713-TCTR-04.

6. Don't show clear zone on the Typical Cross Section sheet(s) for 3R projects.

7. The Quality Assurance Form is to be signed by both the Designer and the Reviewer.

8. Show beginning and ending stations on the title sheet.

9. When using concrete pavement with an asphalt shoulder in a rural area please note that for a 2 lane section the concrete pavement is 7.8 m (not 7.2 m) wide. See figure 52-6F. Also note that the lanes are marked at 3.6 each and that the 2% cross slope continues for the additional 600 mm width of the concrete pavement.

10. Design Memorandum #42 discusses when to use Type A and Type B outlet protectors for underdrain pipes. Type A outlet protectors are to be used on the outside of all Interstate highways.

11. With respect to Foundation Reviews, do not submit them showing options (for example, 40 tons, 55 tons, and 70 tons for the design load). Wait until you know your recommendation. Also note that you can obtain Design Approval without the Foundation Review.

12. With respect to steel bridges that are to be painted, the Designer needs to show on the plans or in a special provision which color is to be used. Even when it is weathering steel, a color must be specified if any of the steel is to be painted.

Subsurface Drain Outlet Elevations

Subsurface drain outlet pipes shall be a minimum of 300 mm above Q10 elevation.

Horizontal Stopping Sight Distance

Horizontal stopping sight distance is a critical design element (level 1). In spite of this, recently we have seen projects that did not take this element into account; hence, revisions were necessary. Even though the criterion for minimum radius (another critical design element) is met, it is necessary to check the horizontal stopping sight distance. Section 43-4 discusses horizontal stopping sight distance. The criteria are the same regardless if it is a 3R or a 4R project.

When the length of curve (L) is greater than the sight distance (S) for the design speed (V) the following formula applies:

$$M = R\left[1 - \cos\left(\frac{28.65\ S}{R}\right)\right]$$

Where:

M = Middle ordinate, or distance from the center of the inside travel lane to the obstruction, m

R = Radius of curve, m

S = Sight distance, m

Figures 43-4A (Desirable Stopping Sight Distance) and 43-4B (Minimum Stopping Sight Distance) are derived using the above formula. Using the figures is recommended if they provide sufficient accuracy; otherwise the formula should be used to be sure adequate horizontal stopping sight distance is provided.

It is noted that the following are considered obstacles: walls, earth, wooded areas, buildings, crops, bridge rail, guardrail, concrete median barrier. This list is not a complete list of all obstacles.

The height of eye is 1070 mm and the height of object is 150 mm. Both the eye and the object are assumed to be in the center of the inside through travel lane. If the lane width for a ramp is wider than 3.6 meters then the horizontal stopping sight distance should be calculated by placing the eye and object 1.8 meters from the edge of the lane on the inside of the curve.

When the length of curve (L) is less than the sight distance (S) for the design speed (V) it is recommended that the horizontal stopping sight distance be checked graphically.

Corrective actions to be considered to obtain the requisite horizontal stopping sight distance include:

1. remove the obstruction
2. widen the shoulder (total width of shoulder shall not exceed 3.6 m – see p. 222 of the Metric Green Book, 1994 edition)
3. modify the horizontal alignment

Consultants shall submit their computations for horizontal stopping sight distance at the Grade Review or Structure Size and Type stage or the next plan submission after receipt of this document. The INDOT reviewer shall review the computations to be sure that the criteria for horizontal stopping sight distance has been met.

Section 42-1.03 discusses horizontal stopping sight distance for trucks which is a level 2 design element.

Horizontal Stopping Sight Distance and Intersection Sight Distance

When calculating the horizontal stopping sight distance and intersection sight distance provided assume that a barrier to the line of sight will be constructed on the right-of-way line. Even though there is no barrier there today a property owner could erect one at any time. If adequate horizontal stopping sight or intersection sight distance is not provided based upon the above assumption then the designer should consider buying additional right-of-way, altering the alignment, etc. If the appropriate horizontal stopping sight is not provided it will be necessary for the designer to obtain a design exception. If the intersection sight distance does not meet appropriate criteria then the designer must document not meeting level 2 criteria.

Traffic Count Requests

1. Don't ask for new traffic counts if the traffic counts contained in the scope are within a couple years of the design year.

2. Be specific about the location(s) where traffic counts are needed.

3. Be realistic about the requested due date for the traffic counts.

Temporary Runaround

Please note that Materials and Tests desires 75 kg/m² HMA for the surface layer (instead of 60 kg/m² shown on Standard Drawing 713-TCTR-04) and to decrease the intermediate layer to 345 kg/m² (instead of 360 kg/m²).

Element Review

INDOT implemented element review on May 30, 1997. The first element reviewed was bearings. No problems were encountered. The second element reviewed was decks, and no problems were encountered.

Recently, we completed review of prestressed concrete beams. The following reminders regarding design thereof are made:

1. With respect to Indiana modified bulb-tee beams, do not debond the strands located adjacent to the side faces of the beam. See Bridge Memorandum #248, item 17C. Although the beam reviewed was a bulb-tee, the same policy should be followed with respect to other prestressed members.

2. The maximum stirrup spacing in prestressed concrete I beams shall be 2 t, where t is the thickness of the web. This is the same requirement as that contained in the "old" bridge design manual at 8-410.098.

Asphalt Pavement

1. When you have a resurface section that calls for 60 kg/m² surface on 120 kg/m² intermediate, switch it to 75 kg/m² surface and 105 kg/m² intermediate. Therefore the English projects should be switched from 110 lb/SYS surface and 220 lb/SYS intermediate to 140 lb/SYS surface and 190 lb/SYS intermediate.

2. In Mr. Andrewski's April 23, 1998 memorandum it says that the increases to surface and intermediate layers are to be "subtracted from the base layer design as long as the remaining lift thickness does not violate standard specifications. (135 kg/m² for HMA Base 25 mixtures)." If this situation arises increase the surface layer to 75 kg/m² and make the remainder of the asphalt section intermediate. For example, convert 60 kg/m² surface, 120 kg/m² intermediate, and 180 kg/m² base to:

   75 kg/m² surface
   285 kg/m² intermediate

3. When S-Line pavement sections are converted to 75 kg/m² HMA Surface and 165 kg/m² HMA Intermediate, the plans shall indicate that the new desired lift thicknesses override the thicknesses shown on the standard drawings for public road approaches. It is anticipated that the lift thicknesses shown on the standard drawings for public road approaches and drives will not be changed until the Sept. 1, 1999 release of revised standard drawings. After the revised standard drawings are released, all drives should have the new thicknesses shown in the approach table.

4. Please include Special Provision 400-R-366 "HMA Revised" in all contracts with HMA pay items until at least Sept. 1, 1999.

Woody Vegetation Procedures

The new procedure for processing Woody Vegetation plans is as follows:

1. The Woody Vegetation plans should be transmitted to the pertinent Project Coordinator at the Preliminary Field Check and Final Plan stages. The submittals will be logged in by the Project Coordinator and sent to the Landscape Architect for review.

2. When the plan review has been completed, the Landscape Architect will send a memorandum to the Designer with a copy to the pertinent Project Coordinator. Note, a copy of the memorandum will be sent to the pertinent Design Project Manager, if it is a Consultant-Designed project.

Storm Drain Design Schedule

CEI has expressed a concern that final design of storm drains at the preliminary field check phase typically results in design revisions after the preliminary field check and design hearing. The critical factor in the timing of storm drain design is utility coordination. The new policy shall be as follows:

1. Preliminary inlet spacing and trunk line design shall be included in Preliminary Field Check Plans as is needed to perform early coordination with utility companies.
2. Final storm drain design shall be included in Hearing Plans so that final utility coordination can begin upon design approval.

Maintenance of Traffic on Rural Interstates When Using Crossovers

When crossovers are used to maintain one lane of traffic in each direction on rural interstates the following will apply:

1. Use temporary concrete median barrier as shown in Appendix “A”.

2. Unless the median shoulder is full depth it will be torn out and replaced with a 1.5 meter section (pavement design to be requested by the designer).

3. The maintenance of traffic will be as shown in Appendix “A”.

4. Rumble strips must be milled into the new shoulder after traffic is crossed over to the other side.

New Evaluation Forms

New evaluation forms, shown in Appendix "B", have been implemented for design exception and Technical Services Section reviews. The results of these evaluations will be included in performance computations performed for the selection decision making process.

Composite Design

It is acceptable to use composite design in the negative moment region of steel beams and girders. It is the designer's choice whether to use composite design in the negative moment region.

New Location Control Route Survey Plat Routing Procedure

Location Control Route Survey Plats, previously sent to and kept in the Land Acquisition Division when completed, will now be kept with survey materials and be submitted by the designer with Right-of-Way Plans. A print of the Location Control Route Survey Plat should be submitted with Preliminary Right-of-Way Plans and the mylar of the Location Control Route Survey Plat should be submitted with the Final Right-of-Way Plans.

1. <u>In-house Developed Surveys</u>

   Location Control Route Survey Plats for in-house developed surveys will be transmitted to Land Acquisition to be recorded and then transmitted back to the Design Division vault to be held until the project is assigned to a designer. Once assigned to a designer the Location Control Route Survey Plat will be transmitted to the designer along with the survey and held by the designer until submittal of Right-of-Way Plans.

2. <u>Open-end Contract Surveys</u>

   Surveys, when completed, along with the signed/sealed/recorded Location Control Route Survey Plat will be held in the Design Division vault until the project is assigned to a designer. Once assigned to a designer the Location Control Route Survey Plat will be transmitted to the designer along with the survey and held by the designer until submittal of Right-of-Way Plans.

3. <u>Design Consultant Developed Surveys</u>

   For projects where the survey is performed by the design consultant the designer shall submit the survey and signed/sealed/recorded Location Control Route Survey Plat with Grade Review/Structure Size and Type Plans to be logged in and given a survey book number. Once logged in and numbered the survey and Location Control Route Survey Plat will be returned to the designer. The Location Control Route Survey Plat will then be held by the designer until submittal of Right-of-Way Plans

Pay Item and Bid History Updates for 'Estimator'

The Technical Services Division now has the pay item and bid history updates available on the Internet for 'Estimator' (formerly known as HighEst). The updates are available within the secured consultant area that can be accessed from http://www.ai.org/dot/design/consult.htm.

The current files are dated 3/25/98 for bidhiste.exe and bidhistm.exe and 5/31/98 for itemcat3.exe and itemcat5.exe. We expect to have new files available in about 6 weeks.

New format for Bridge and Road Summaries

There have been some changes lately to the content and requirements of the information on the Summary sheets:

- Guardrail Summary Tables are now required on all project with related pay items (see CSB #98-1)
- Structure Data Tables must be updated for additional pipe information (see Des. Memo #42)
- Pay items for asphalt materials (HMA) are now specified in place of bituminous.

In an attempt to bring the summary tables up to date per the current requirements, INDOT has assembled 2 new summary frames. See Appendix "C" for examples. The data on the new summary sheets is to be as follows:

BRIDGE SUMMARY - Summary of Bridge Quantities Table and misc. information, if needed
ROAD SUMMARY - Pavement Quantities & Approach Table; Structure Data; PSD, Riprap Ditch & Sodding Table; Underdrain Table; Guardrail Summary table; Mailbox Approaches info.

For large Road or Bridge Projects where the standard summary tables could not accommodate all the items, please continue using multiple custom Summary Sheets to accommodate all the needed data.

Projects receiving Design Approval on or after July 1, 1998 shall be handled as follows:

a) Every bridge project will have 2 summary sheets – a Bridge Summary and a Road Summary.
b) Minor road projects will have a Road Summary sheet.
c) Major road projects will continue to have multiple Road Summary sheets.

Projects with Design Approvals prior to July 1, 1998 must have their existing summary tables updated to include Service Life, Site Designation and pH for pipes; HMA indicated for approaches; and Guardrail Summaries shown elsewhere on the plans.

The Summary Sheet frames (in DXF format) can be downloaded from www.ai.org/dot/design.

Revision to "Procedural Manual for Preparing a Design Summary"

Please replace the title sheet and page No. 3 of the "Procedural Manual for Preparing a Design Summary" with the revised sheets included in Appendix "D". The revision adds item No. 11. to Section 2.c. "Miscellaneous Project Related Information..:".

Erosion at Ends of Bridges

Because of continuing erosion problems at the ends of bridges the riprap limits are to be extended to a point 2.0 m beyond the end of the concrete barrier transition. The details for Riprap and Sodding limits found in Appendix "E" shall be incorporated into all appropriate bridge projects effective with the March 1999 letting. The information shall be incorporated into the General Plan or the sketches shown may be reproduced in the plans until standard drawings can be developed.

ESALS

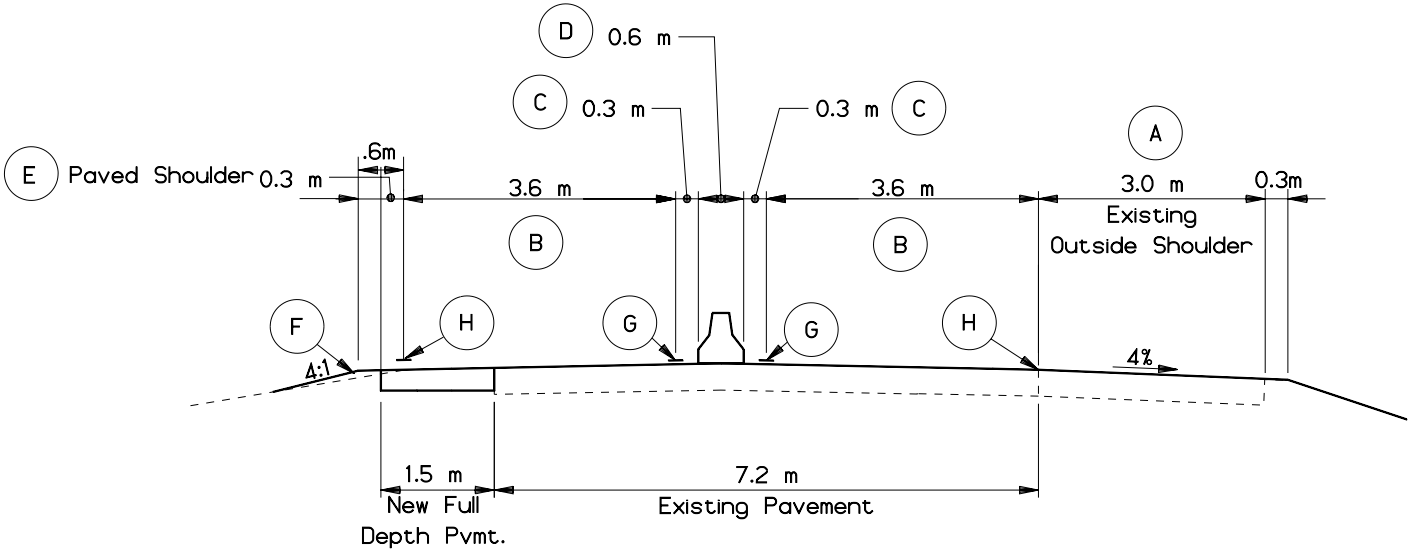
Projects which use section 402 asphalt (instead of the QC/QA section 401 asphalt) may use the following table to determine ESALs to be shown on the title sheet.

EXISTING AADT	MIXTURE ESALS
<1000	250,000
1000 - 3999	500,000
4000 - 9999	2,000,000
10,000 - 29,999	7,500,000
30,000 - 49,999	20,000,000
>50,000	60,000,000

Use the most recent AADT (closest to the year of construction) available and select the ESALs.

Fish & Wildlife Review Form Distribution List

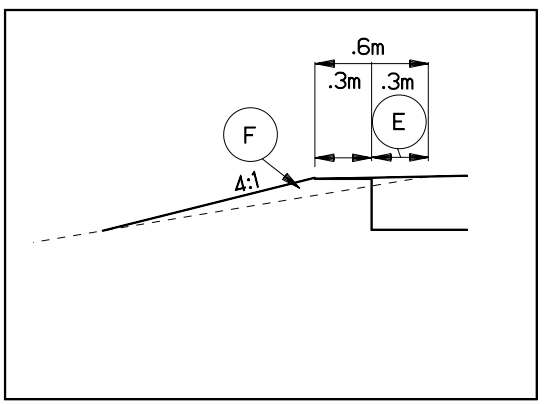
Please remove Amy Rayl, IDEM, from the distribution list for Fish & Wildlife Review Forms and replace it with: IDEM, Office of Water Management. The address is P.O. Box 6015, Indianapolis, Indiana 46206-6015.



MAINTENANCE OF TRAFFIC ON RURAL INTERSTATES WHEN USING CROSSOVERS

NOTES:

- (A) Existing outside shoulder (paved)
- (B) Travel lane
- (C) Offset from temporary concrete medium barrier for placement of temporary pavement markings (solid yellow 100 mm)
- (D) Temporary concrete median barrier
- (E) Paved shoulder
- (F) Compacted aggregate or asphalt milling
- (G) Temporary pavement marking solid yellow 100 mm
- (H) Temporary pavement marking solid white 100 mm



AMB/9-17-98

ROUTING / EVALUATION FORM / DESIGN PLAN PROCESS

Design Exception

Consultant: _____

Description: _____

Structure: _____

CN Project: _____

Des. #(s): _____

REVIEWER'S RATING ITEMS

Identification of need	_____	**********
Analysis	_____	* 5 - Excellent *
Procedure / Compliance	_____	* 4 - Good *
Cooperation	_____	* 3 - Marginal *
Timeliness	_____	* 2 - Poor *
		* 1 - Unsatisfactory *
		**********

Comments:_____
_____
_____
_____
_____
_____
_____
_____

Are the revisions major? YES NO (Circle Yes or No)

Reviewer's Signature:_____ Date:_____

RETURN TO Jeff Clanton, Room N642

c:\rating des.exp

ROUTING / EVALUATION FORM / DESIGN PLAN PROCESS
Technical Services

CONTRACT NO.: **LETTING:** **DISTRICT:**

DES\PROJECT\STR. NO.	RD #\TYPE OF WORK \ LOCATION	DESIGNER\SEC\PROJ.

REVIEWER'S RATING ITEMS

Plans	_____	**5 - Excellent**
Special Provisions	_____	**4 - Good**
Pay Items	_____	**3 - Marginal**
Procedure / Standard Compliance	_____	**2 - Poor**
Cooperation	_____	**1 - Unsatisfactory**

Comments:_____

Are the Revisions Major? YES NO (Circle YES or NO)

Reviewer's Signature:_____ **Date:**_____

RETURN TO Jeff Clanton, Room N642

cc: file (EvalTech)

PAVEMENT QUANTITIES AND APPROACH TABLE

LOCATION	DESCRIPTION (APPROACH TYPE OR CLASS)	WIDTH	LENGTH	RADII	DISTANCE BEYOND R/W LINE	SURFACE BEYOND R/W LINE: COMPACTED AGGREGATE BASE	SURFACE BEYOND R/W LINE: HMA	SURFACE BEYOND R/W LINE: CONCRETE	GRADE 1	GRADE 2	EXCAVATION CUT	EXCAVATION FILL	CLEAR ZONE AT DRIVE	HMA FOR APPROACHES kg/m²	HMA FOR APPROACHES kg/m²	HMA FOR APPROACHES kg/m²	HMA FOR APPROACHES kg/m²	HMA MATERIALS kg/m²: SURFACE 9.5 mm, M-LINE	HMA MATERIALS kg/m²	HMA MATERIALS kg/m²: INTERMD 19.0 mm M-LINE	HMA MATERIALS kg/m²	HMA MATERIALS kg/m²: BASE 25.0 mm M-LINE	HMA MATERIALS kg/m²	HMA MATERIALS kg/m²	HMA BASE 25 mm, M-LINE	SEAL COAT TYPE 2	SEAL COAT TYPE 5	ASPHALT MATERIAL FOR PRIME COAT	ASPHALT MATERIAL FOR TACK COAT	COMPACTED AGGREGATE FOR BASE NO. 53 DEPTH	COMPACTED AGGREGATE FOR BASE NO. 53 DEPTH	COMPACTED AGGREGATE FOR BASE NO. 53 DEPTH	COMPACTED AGGREGATE FOR BASE NO. 53 DEPTH	COMPACTED AGGREGATE FOR SURFACE NO. 73 DEPTH	COMPACTED AGGREGATE FOR SURFACE NO. 73 DEPTH							REMARKS
		m	m	m	m	m²	m²	m²	%	%	m³	m³	m	m²	m²	m²	m²	m²	m²	m²	m²	m²	m²	m²	Mg	m²	m²	m²	m²	m²	m²	m²	m²	m²	m²							

STRUCTURE DATA

STRUCTURE NUMBER	LOCATION: STATION	LOCATION: LEFT	LOCATION: CROSS	LOCATION: RIGHT	SIZE	PIPE TYPE	MANHOLE, INLET, CATCH BASIN, OR SPECIALTY STRUCTURE	LENGTH	SKEW	FLOW LINE: COVER	FLOW LINE: UP STREAM	FLOW LINE: DOWN STREAM	SERVICE LIFE	SITE DESIGNATION	pH	BACKFILL METHOD	B-BORROW FOR STR. BACKFILL	REVETMENT RIPRAP	CONCRETE, CLASS A, FOR STR.	PIPE END SECTION	GRATED BOX END SECTION	GRATED BOX END SECTION	GRATED BOX END SECTION	SAFETY METAL END SECTION	SAFETY METAL END SECTION	SAFETY METAL END SECTION	CONNECT TO STR.	REMARKS
					m			m		m	ELEV.	ELEV.	YR.				m³	Mg	m³	EA.	TYPE	SLOPE	EA.	TYPE	SLOPE	EA.		

UNDERDRAIN TABLE

LONGITUDINAL DRAINS: STATION LT	LONGITUDINAL DRAINS: STATION RT	LONGITUDINAL DRAINS: STATION	100 mm TYPE 4 PIPE	150 mm TYPE 4 PIPE	200 mm TYPE 4 PIPE	AGGREG. FOR UNDERDRAINS	GEOTXT. FOR UNDERDRAINS	OUTLET PIPES: AT STATION	45°ELLS	WYE	100 mm PVC PIPE	150 mm PVC PIPE	200 mm PVC PIPE	B-BORROW FOR STR. BACKFILL	OUTLET PROTECTOR, TYPE A	OUTLET PROTECTOR, TYPE B	DELINEATOR POST	SODDING	CONNECT TO STR. NO.	REMARKS
LT	RT		m	m	m	m³	m²		EA.	EA.	m	m	m	m³	EACH	EACH	EACH	m²		
		TOTALS																		

PAVED SIDE DITCH, RIPRAP DITCH AND SODDING SUMMARY TABLE

LOCATION: FROM STATION	LOCATION: TO STATION	LEFT	MEDIAN	RIGHT	PAVED SIDE DITCH: ACTUAL LENGTH	CUT OFF WALLS (2.5 m EQUIVAL. LENGTH EACH)	LUGS (2.5 m EQUIVAL. LENGTH EACH)	TOTAL EQUIVALENT PAY LENGTHS TYPE	TOTAL EQUIVALENT PAY LENGTHS TYPE	TOTAL EQUIVALENT PAY LENGTHS TYPE	TOTAL EQUIVALENT PAY LENGTHS TYPE	TOTAL EQUIVALENT PAY LENGTHS TYPE	RIPRAP DITCH: REVETMENT RIPRAP	UNIFORM RIPRAP	GEOTEXTILES	SODDING: FOR PAVED SIDE DITCHES	FOR DITCHES	FOR MEDIAN	FOR SHOULDER BREAK	SODDING AT BRIDGE CONE	TOTAL SODDING	NURSERY SODDING FOR LAWNS
					m	EACH	EACH	m	m	m	m	m	Mg	Mg	m²	m²	m²	m²	m²	m²	m²	m²
TOTALS																						

GUARDRAIL SUMMARY TABLE

LOCATION: FROM STATION	LOCATION: TO STATION	LEFT	MEDIAN LEFT	MEDIAN RIGHT	RIGHT	W-BEAM GUARDRAIL LENGTH: STANDARD POST AT 1.905 m SPA.	STANDARD POST AT 0.952 m SPA.	STANDARD POST AT 0.476 m SPA.	DOUBLE FACED AT 1.905 m SPA.	LONG POST AT 1.905 m SPA.	LONG POST AT 0.952 m SPA.	LONG POST AT 0.476 m SPA.	SHOP CURVED AT ___ m SPA.	NESTED GUARDRAIL	GUARDRAIL FLARE RATE	GUARDRAIL TRANSITION TYPE TGB	GUARDRAIL TRANSITION TYPE WGB	GUARDRAIL TRANSITION TYPE GP	GUARDRAIL TRANSITION TYPE WH	GUARDRAIL END TREATMENT MS	GUARDRAIL END TREATMENT OS	GUARDRAIL END TREATMENT TYPE 1	CURVED W-BEAM GUARDRAIL SYSTEM: TERMINAL SYSTEM	TERMINAL SYSTEM	CONNECTOR SYSTEM	CONNECTOR SYSTEM	GUARDRAIL REMOVE	GUARDRAIL RESET	REMARKS
						m	m	m	m	m	m	m	m	m		EACH	EACH	EACH	EACH	EACH	EACH	EACH	TYPE	EACH	TYPE	EACH	m	m	
TOTALS																													

MAILBOX APPROACHES

LT/RT	℄ BOX STATION	DESCRIPTION	WIDTH W,(m)	ASSEMBLY REQ'D SINGLE	ASSEMBLY REQ'D DOUBLE	
		TOTAL				

REVISIONS

DATE	ITEM

RECOMMENDED FOR APPROVAL ______ DESIGN ENGINEER DATE

DESIGNED: ______ DRAWN: ______

CHECKED: ______ CHECKED: ______

INDIANA DEPARTMENT OF TRANSPORTATION

ROAD SUMMARY OF QUANTITIES

	BRIDGE FILE
	DESIGNATION
SURVEY BOOK	SHEETS of
CONTRACT	PROJECT

SUMMARY OF BRIDGE QUANTITIES

ITEM	CONCRETE						CONCRETE RAILING CLASS C		REINF. STEEL	EPOXY COATED REINF. STEEL	STRUCT. STEEL	ANCHOR PLATES MK-AP	PILES										CAST IRON DRAIN PIPE	CAST IRON GRATES, BASINS, & FITTINGS	EXP. JOINT TYPE	EXP. JOINT CLASS	CONC. STR. MEMBERS		BARRIER DELINEATORS	SURFACE SEAL ==	CONC. BR. RAILING TRANSIT. TYPE	REINF. CONCRETE PAVEMENT, 250 mm
	CLASS C SUPERSTR	CLASS A SUBSTR	CLASS B FOOTING										CONC. STEEL SHELL ENCASED		REINF. CONC. STEEL SHELL ENCASED EPOXY CONT.		STEEL H		STEEL H EPOXY COATED		STEEL H REINF. CONC. ENCASED		PILE TIP STEEL H	CORED HOLES IN ROCK					BOX BEAMS TYPE	I BEAM TYPE				
	m³	m³	m³				m³	m	kg	kg	kg	EACH	NO.	m	NO.	m	NO.	m	NO.	m	NO.	m	EACH	NO.	m	kg	kg	m	m	m³	m	EACH	m²	EACH	m²
BRIDGE APPROACH SLAB																																		
APPROACH SLAB EXTENSIONS																																		
TOTALS																																		

== ESTIMATED QUANTITY

REVISIONS	
DATE	ITEM

RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE

DESIGNED: _____ DRAWN: _____

CHECKED: _____ CHECKED: _____

INDIANA DEPARTMENT OF TRANSPORTATION

BRIDGE SUMMARY OF QUANTITIES

	BRIDGE FILE
	DESIGNATION
SURVEY BOOK	SHEETS
CONTRACT	of PROJECT

PROCEDURAL MANUAL FOR PREPARING A DESIGN SUMMARY

A DIVISION OF DESIGN DOCUMENT

REV. MAY 1998

important design elements or features that were not addressed in the environmental document should be included in the Design Summary.

The first sentence of the Design Summary should include the work category. Examples of work category include: Added Travel Lanes, Bridge Replacement, Road Reconstruction, etc.

a. Roadway - the following minimal data should be included:
    1. total project length
    2. changes in horizontal and vertical alignment
    3. length of approach work from each end of a bridge (for bridge projects only)
    4. note whether the intersection sight distance meets the applicable criteria for the project
b. Structure (if applicable) - the following minimal data should be included:
    1. description of the structure - structure type, span lengths, skew
    2. clear roadway width of structure

c. Miscellaneous Project Related Information - when applicable, the following project features should be briefly addressed:

    1. significant county road relocations
    2. less than standard intersection sight distance
    3. underground storage tank remediation
    4. channel relocation
    5. clearing of wooded/forest areas
    6. significant historical/archaeological considerations
    7. sidewalks
    8. design exceptions
    9. level two design criteria not met
    10. permanent road closures
    11. permanent median crossover closures (non-Interstate)

d. Discussion of Alternates - It is not necessary to repeat the discussion of alternatives contained in the Preliminary Engineering Study and the environmental document. In most cases the Public Hearings Section can refer to the environmental documents which they have on file.

3. Need for Improvement

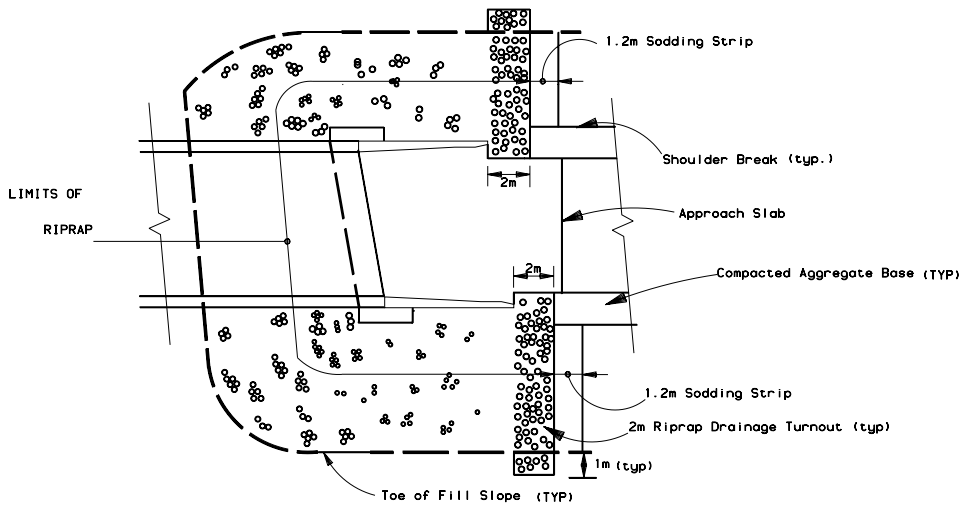
a). The need for improvement should include a brief description of the existing facility and the current condition of the facility. For bridges, discuss the existing structure condition, substandard geometrics, or the inadequacy of the existing waterway opening.

b). The accident history of the project location should be briefly discussed in this section, if it is a contributing factor to the need for the project.

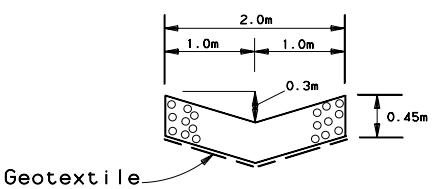
c). For <u>major projects</u> the following additional points <u>may be</u> applicable:

- Transportation demand - including the urban transportation plan.

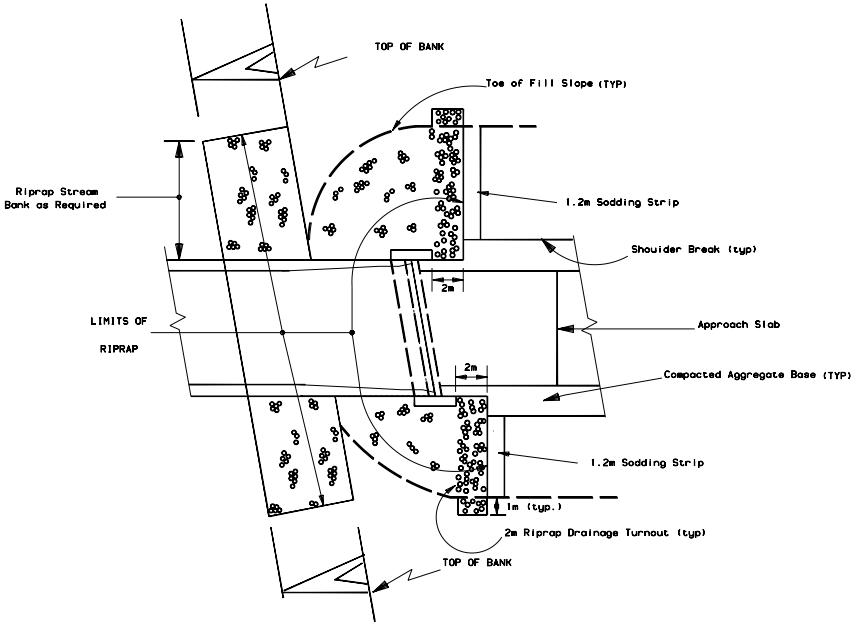
- Federal, state or local government authority (legislation) directing the action.



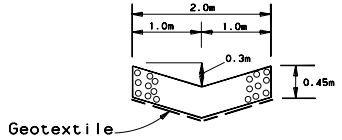
RIPRAP AND SODDING LIMITS WITH BARRIER TRANSITIONS ON APPROACH SLAB



Section Through
Riprap Drainage Turnout



RIPRAP AND SODDING LIMITS WITH BARRIER TRANSITIONS ON BRIDGE



Section Through
Riprap Drainage Turnout

GENERAL NOTES ON SHEET 2 OF ROAD PLANS

1. Standard divided lane sections for Federal Aid _____ Projects _____ as shown on Sheet No. _____ to be used with this project.

2. Standard ramp section _____ to be used on this project. Pavement thickness shall be _____ inches.

3. Standard single lane pavement sections _____ as shown on Sheet No. _____ to be used on this project.

Notes 1 through 3 should be discontinued. The English standard sections are no longer being called for with English projects. There are no metric versions of these details. Typical sections are always detailed on the plans.

4. A _____ inch pavement shall be used.

This note should be discontinued. The information is shown on the detailed typical sections. Why show the information twice? If it changes, it must be changed twice.

5. Typical cross section as shown on Sheet No. _____ to be used on this project.

This note should be discontinued. The information is shown immediately to the right of the note in the Index.

6. Standards under dates as listed in the index on this sheet to be used on this project.

This note should be discontinued. It is redundant for an English project. It is inaccurate for a metric project since the metric drawing index is not shown on the plans, but instead, in the Contract Information book.

7. All ditches of 1% grade or steeper shall be sodded except where ditches are in rock cuts or where paved side ditches shall be constructed.

This note should be deleted. A table shows paved, riprap and sodded ditches.

8. Sodding shall be placed as shown on Standard or Typical Cross Sections and on Miscellaneous Standard Sheet “MB”.

This note should be discontinued. The information is shown on the plans and the standard details. It is inaccurate for a metric project.

9. All earth shoulders, median areas, and cut and fill slopes shall be plain or mulch seeded except where sodding is specified.

This note should be retained. It should be worded as shown above.

10. Overhaul and added haul quantities shown in the balances are for information only.

This note should be deleted. The Design Manual is deleting the requirement for this information to be shown.

11. Excavation quantities shown include estimated excavation for public and private approaches. See table on Sheet _____.

This note should be deleted. The table shows this information.

12. The final cross sections of the grading contract will be the original cross sections of the paving contract. However, partial or complete cross sections shall be taken if necessary to determine the actual excavation quantities.

13. The paper relocation will be cross sectioned by the Engineer before construction.

14. Existing asphalt pavement located outside the construction limits, between Sta. _____ and Sta. _____, shall be removed as directed.

Notes 12 through 14 should be retained. They should be worded as shown above.

15. The minimum grade for underdrains shall be 0.2%. Special underdrain grades will be established by the Engineer where the profile grade is less than 0.2%.

This note should be deleted. It is redundant. See 718-UNDR-01, note 5.

16. All Limited Access R/W (L.A. R/W) to be fenced with Chain Link Type Fence (C.L.T.F.) or Farm Field Type Fence (F.F.T.F.) as specified in the plans.

This note should be discontinued. It is redundant since the information is shown on the Plan and Profile sheets.

17. The quantity Crown-Vetch Seeding, shown on the Estimate of Quantities Sheet is to be used at those locations where the slopes are 3:1 or steeper or in an area requiring cut or sand fills or as directed by the Engineer.

This note should be discontinued. The information is shown in 621.06(d) of the Standard Specifications.

18. The quantity of peat excavation shown on the plans has been estimated on the basis of theoretical cross sections by using treatment of existing fills, treatment by removal, or treatment by displacement, where each treatment applies.

This note should be retained. It should be worded as shown above.

19. Preformed Joint Material for Cross-Over, Drives, Road Approaches and Sidewalks, will not be paid for directly, the cost thereof is to be included in the contract unit price for the various items in the contract.

This note should be discontinued. This is a basis of payment specification which is shown where required in the Standard Specifications.

20. For Paved Side Ditch and Sodding Quantities see table on Sheet No. _____.

This note should be discontinued. The information is shown immediately to the right of the note in the Index.

21. The Engineer may change the type of fence shown on the plans upon receipt of written justification from the property owner.

This note should be deleted. INDOT retains the right to issue change orders; hence, this note is unnecessary.

22. Prior to extending existing pipe structures, headwall in place on extended end shall be removed.

This note should be discontinued. This information is shown in the standard drawings.

23. Movement of excavated material is shown in the Mass Haul Diagram on Sheet _____. The entire project is included in one balance.

This note should be deleted. Mass haul diagrams are no longer required.

JEJ:ps
a:\gen-notes rd plan.jej[7]

INDIANA DEPARTMENT OF TRANSPORTATION
INDIANAPOLIS, INDIANA 46204-2249
INTER-DEPARATMENT COMMUNICATION

AUGUST 5, 1998

TRAFFIC MEMORANDUM 98-01
TRAFFIC SIGNALS

MEMORANDUM

TO: District Traffic Engineers

FROM: Timothy D. Bertram, Chief
Operations Support Division

SUBJECT: Installation and Usage of Count Detectors

The Indiana Dept of Transportation will use and place count detectors on all approaches, for each phase of an intersection that is signalized and operating as an actuated traffic signal on the state system of highways. In addition, regardless of having a phase for the left turn maneuver, all designated left turn lanes, either marked or de-facto shall have a count detector installed.

This requirement for count detectors at actuated traffic signals will begin immediately, however, projects already completed or ready for letting will not be required to have the count detectors added to the contract or location. It is expected that all plans for actuated traffic signals submitted for letting after October 1, 1998 will include the count detectors for all phases and any additional left turn lanes.

TDB/CTT/ctt

Cc: Jim Poturalski
Homer Unger
Sami Mohamed
Lori Land
Ed Cox
Frank Vukovits
Dennis Belter (3)
Traffic Field Engineers (3)

BRIDGE REPLACEMENT SPECIAL PROVISION CHECKLIST **9-10-98**

Every bridge replacement project will have the following:

100-C-150 106-C-074 106-R-276

- 100-C-146 Min. Wage (Lake, LaPorte, Porter and St. Joseph County) OR
- 100-C-147 Min. Wage (Elsewhere)
- 104-C-139 Geotechnical Evaluation Report
- 105-R-305 Pipe Structure Pay Items
- 107-C-051 U.S. Army Corps of Engineers Permit
- 107-R-169 Existing Conditions of Additional R/W, Utilities, etc.
- 206-B-113 General Bridge Requirements (If Design Approval after 3-1-94)
- 211-R-357 B-Borrow and B-Borrow for Structure Backfill
- 400-R-366 HMA Revised (All contracts with HMA)
- 601-R-183 Guardrail End Treatments
- 621-R-283 Seeding Outside Construction Limits
- 715-R-361 Pipe Material Abbreviations

Many bridge replacement projects will also require the following:

- 107-B-040 Environmental Restrictions
- 201-C-052 Clearing R/W (Pay item: Clearing R/W)
- 203-R-360 Embankments constructed of CCBP (Borrow>3800 m3)
- 701-B-101d Pile Driving and Equipment Data Form
- 701-B-132 Pile Driving
- 707-B-013 High Range Water Reducers in Prestressed Beams
- 715-R-341 Pipe Material Selection (Pipes Referred to as Groups)
- 715-R-342 Pipe Backfill Methods (Pipes Referred to as Groups)
- 718-R-326 Underdrains (When old pipe groups are used)
- 718-R-326A Underdrains (When new pipe stds. are used)
- 808-B-114 "No Passing" Zone Repainting
- 907-R-359 Listing of Approved Plastic Pipe Sources

Other occasionally recurring bridge related special provisions:

- 103-C-036 Owners and Contractors Liability Insurance (LPA Contracts only)
- 107-R-042a Railroad Information
- 107-R-042b Protection of Railway Interest
- 203-B-025 Marion County Borrow Pits
- 203-R-155 Rock Backfill
- 203-R-205 Wetland Identification (If project has Waste Excavation)
- 203-R-286 Excess Excavated Materials Disposal Site (If Waste)
- 601-R-146 Removal of Guardrail (If Guardrail Requested by District)
- 622-R-209 Wildlife Habitat (Do Not Use if Shown on Plans)
- 701-B-068 Bitumen Coating for Piles
- 701-B-078 Oversized Predrilled Pile Holes for Integral End Bent Structures

- 703-C-138 Reinforcing Steel (Projects with Hard Metric Rebars)
- 706-B-112 Curb Mounted Bridge Railing
- 713-B-076 Temporary Pipe (Pay Item: Temp. Pipe and Approaches)
- 714-R-282 Precast Reinforced Concrete 3-Sided Culvert
- 720-R-173 Proof Load for Castings (Pay Item: Inlet, Catch Basin or Manhole)
- 724-B-086 Approved Expansion Joint SS Devices
- 726-B-044 Bearing Assemblies
- 728-B-039 Masonry Coating (Urban Projects)
- 806-B-115 Temporary Traffic Signal with Loop Detector (One Lane Traffic)
- 808-M-016 Removal of Snowplowable Markers

Road Special Provisions Occasionally Recurring in Bridge Projects:

- 203-R-121 Borrow Pit Wetland Enhancement (If Requested by F&W)
- 215-R-189 Lightweight Engineered Fill
- 617-R-188b Geogrid
- 714-R-003 Bin Type Retaining Wall
- 717-R-152 Alternates to Structural Plate Pipes
- 731-R-202 Mechanically Stabilized Earth Retaining Walls
- 801-R-288 Solar Power Assisted Flashing Arrow Sign

For Projects that require "Removal of Buildings" Include:

- 108-L-001
- 108-L-012 Speciality Pay Items (Pay Item: Asbestos Testing and Removal)

Note: This is only a suggested list of Recurring Special provisions. It is the Project Manager's responsibility to compile an accurate list.

INDIANA DEPARTMENT OF TRANSPORTATION
INDIANAPOLIS, INDIANA 46204-2249
INTER-DEPARATMENT COMMUNICATION

M E M O R A N D U M

To: To All Design Engineers / Design Consultants

From: Phelps H. Klika, Chief
Division of Design

Date June 29, 1995

Subject: Cross Section Data

INDOT Field Engineers will require the elevations for existing cross-sections in order to calculate final earthwork quantities. In the past this information was available from the survey book, but now with the new electronic survey system, this information has not been provided.

All projects designed using electronic survey shall include with the design calculations a data table created from your cadd cross-sections which indicates all existing cross-section elevations. For projects already completed we request that existing elevation data tables be submitted by September 1, 1995.

Example Attached

This memo is being included as a reminder.

1
DATE : 13JUN95 TIME : 08:58:37
MOSS

REPO SECTIONS DESIGN

-----M O D E L N A M E ----	RECORD	SECURITY	DATE LAST U
SECTIONS	195	FREE	13JUN95 8:
DESIGN	194	FREE	13JUN95 8:

992G

LABEL	SUBREF	CONTENTS	NO.PTS	X -MIN	Y –MIN	X –MAX	Y -MAX
G001	MBRA	7705	24	4843	4801	4936	4874

CHAINAGE 2100.000

Point	---X---	----Y---	---Z---	--OFFSET--	-LABEL CUT-
1	4843.480	4873.250	783.566	-58.220	BNDR
2	4843.597	4873.159	783.578	-58.072	TRIA
3	4849.094	4868.863	783.709	-51.096	BNDR
4	4857.378	4862.390	783.784	-40.582	*TR*
5	4865.662	4855.916	783.858	-30.068	BNDR
6	4870.090	4852.456	783.252	-24.449	DLL1
7	4870.323	4852.274	783.292	-24.153	TRIA
8	4870.603	4852.055	783.322	-23.798	TRIA
9	4873.658	4849.668	783.634	-19.921	TRIA
10	4878.029	4846.253	784.052	-14.374	ESL1
11	4881.321	4843.680	784.194	-10.196	TRIA
12	4881.836	4843.277	784.211	-9.542	TRIA
13	4881.930	4843.204	784.214	-9.423	EPL1
14	4890.246	4836.705	783.901	1.131	TRIA
15	4890.299	4836.664	783.899	1.199	RC01
16	4890.359	4836.617	783.895	1.274	TRIA
17	4899.115	4829.774	783.278	12.387	EPR1
18	4900.460	4828.724	783.283	14.093	TRIA
19	4902.977	4826.756	783.239	17.288	ESR1
20	4904.728	4825.389	782.875	19.510	BNDR
21	4913.940	4818.190	782.961	31.202	BNDR
22	4919.066	4814.184	784.485	37.707	TRIA
23	4933.653	4802.785	784.324	56.219	TRIA
24	4935.277	4801.516	784.460	58.281	BNDR

LABEL	SUBREF	CONTENTS	NO.PTS	X -MIN	Y –MIN	X –MAX	Y -MAX
G002	MBRA	7705	21	4854	4814	4958	4898

CHAINAGE 2125.000

Point	---X---	----Y---	---Z---	--OFFSET--	-LABEL CUT-
1	4854.682	4897.293	782.607	-64.367	BNDR

Indiana Department of Transportation

MATERIALS AND TESTS DIVISION
120 South Shortridge Road P.O. Box 19389
Phone: (317) 232-5280 FAX: (317) 356-9351
INDIANAPOLIS, INDIANA 46219-0389

May 13, 1998

Mr. Phelps Klika, Chief
Division of Design
Room N642-IGCN

Subject: Refusal Criteria for H-Piles
Driver to Refusal in Bedrock

Dear Mr. Klika:

We have established a new refusal criteria for H-piles in bedrock. We will no longer drive to "refusal". Instead, we will drive H-Piles to the required ultimate capacity in bedrock.

On Bridge Plans for future projects, we would like to delete the word "refusal" and say "H-Piles driven to 175 Tons ultimate capacity in bedrock", when the piles have design load of 70 Tons. The Pile Load Table should look like the attached sample except that the actual load should be shown instead of 40/55/70 T or 100/137.5/175 T.

If the geotechnical report shows the elevation of the top of bedrock this should be included in the plans. During pile driving, this may help determine if we are driving on a boulder or on bedrock.

If you see problems with, or have any questions about the above, please call us so we can discuss it. If not, please get the word out to the Design Consultants and INDOT Designers.

Very truly yours,

Athar Khan
Chief Geotechnical Engineer

Steve Morris
Geotechnical Engineering Group Leader

SDM/js
cc: ICI - Attn: Mr. Paul Berebitsky
Don Leonard
File

PILE LOAD TABLE

BENT	N^{O}. 1	N^{O}. 2	N^{O}. 3	N^{O}. 4
DESIGN LOAD	40/55/70 T	40/55/70 T	40/55/70 T	40/55/70 T
FACTOR OF SAFETY	2.5	2.5	2.5	2.5
FACTORED DESIGN LOAD	100/137.5/175 T	100/137.5/175 T	100/137.5/175 T	100/137.5/175 T
FRICTION IN SCOUR ZONE	0	10 T	10 T	0
DOWN DRAG FRICTION	0	0	0	0
ULTIMATE LOAD	100/137.5/175 T	110/147.5/185 T	110/147.5/185 T	100/137.5/175 T
TESTING METHOD	BY FORMULA, STANDARD SPECIFICATION 701.06(b)			

H\STATUS\FORMS\PILELOAD.DO